

ROUND 5

TOSS-UP

1) BIOLOGY *Multiple Choice* Growth and development are synonymous, respectively, with which of the following:

- W) division and multiplication
- X) multiplication and division
- Y) multiplication and differentiation
- Z) zygote and embryo

ANSWER: Y) MULTIPLICATION AND DIFFERENTIATION

BONUS

1) BIOLOGY *Short Answer* What are the main products of plasma cells called?

ANSWER: ANTIBODIES

TOSS-UP

2) CHEMISTRY *Multiple Choice* Fish in an aquarium require oxygen to live, which is usually done by pumping air into the fish tank using a mechanical pump. If all other things remain constant, the most effective transfer of oxygen to water comes from:

- W) small bubbles of air
- X) large bubbles of air
- Y) bubbling of cold air
- Z) slow bubbling of air

ANSWER: W) SMALL BUBBLES OF AIR

BONUS

2) CHEMISTRY *Short Answer* Cellulose is a polymer of repeating units of what molecule?

ANSWER: GLUCOSE

TOSS-UP

3) PHYSICS *Short Answer* A color made from the addition of two primary colors is called:

ANSWER: SECONDARY COLOR

BONUS

3) PHYSICS *Short Answer* What law yields an equation that is used in determining crystal structure from interference patterns produced by monochromatic X-rays?

ANSWER: BRAGG'S LAW

TOSS-UP

4) ASTRONOMY *Multiple Choice* Which of the following is NOT true about meteorites:

- W) most of the meteorites that have been found have a high iron content
- X) iron meteorites often contain 10 – 20% nickel
- Y) most of the iron meteorites are octahedrites
- Z) on rare occasions, acid-etched iron meteorites display a pattern called the Widmanstätten pattern

ANSWER: Z) ON RARE OCCASIONS, ACID-ETCHED IRON METEORITES DISPLAY A PATTERN CALLED THE WIDMANSTATTEN PATTERN

BONUS

4) ASTRONOMY *Short Answer* Give the common name for the phenomenon which is the result of sunlight reflecting off the Earth and faintly illuminating the darkened portion of the moon:

ANSWER: EARTHSHINE

TOSS-UP

5) MATH *Short Answer* In statistics, what is the common term for the square root of the variance?

ANSWER: STANDARD DEVIATION

BONUS

5) MATH *Short Answer* Rounded off to the nearest whole year, how many years would it take for your money to double in an investment that was increasing with an annual compound rate of 3.5%?

ANSWER: 20 YEARS

(Solution: rule of 70)

TOSS-UP

6) EARTH SCIENCE *Multiple Choice* Which of the following is NOT likely to have been formed by glaciers:

W) arête (pronounced: are-RET)

X) hanging valley

Y) fjord (pronounced: FEE-yord)

Z) dike

ANSWER: Z) DIKE

BONUS

6) EARTH SCIENCE *Short Answer* Give the common name of the historic mineral that was the original source of radium and the first substance in which helium was discovered on earth:

ANSWER: PITCHBLEND (ACCEPT: URANINITE or UO_2)

TOSS-UP

7) GENERAL SCIENCE *Short Answer* Which federal agency is primarily in charge of our National Laboratories and is charged with ensuring a stable supply of energy for the nation?

ANSWER: DEPARTMENT OF ENERGY (ACCEPT: DOE)

BONUS

7) GENERAL SCIENCE *Short Answer* What is the term for the error of a compass as a consequence of the difference between magnetic North and true North?

ANSWER: DECLINATION (ACCEPT: VARIATION)

TOSS-UP

8) GENERAL SCIENCE *Multiple choice* Ultimately, the character of the pixel which is primarily responsible for the resolution of a CRT is:

- W) size
- X) number
- Y) shape
- Z) color

ANSWER: W) SIZE

BONUS

8) GENERAL SCIENCE *Short Answer* What does the D in DRAM stand for?

ANSWER: DYNAMIC

TOSS-UP

9) BIOLOGY *Multiple Choice* DNA is produced from RNA:

- W) by reverse transcriptase
- X) by an oligoside
- Y) by DNA polymerase
- Z) in yeast as a protective measure

ANSWER: W) BY REVERSE TRANSCRIPTASE

BONUS

9) BIOLOGY *Multiple Choice* Which of the following does NOT belong to the Class Arachnida:

- W) spider
- X) tick
- Y) mite
- Z) shrimp

ANSWER: Z) SHRIMP

TOSS-UP

10) CHEMISTRY *Multiple Choice* Which of the following are NOT carbonate minerals:

- W) calcite
- X) magnesite
- Y) dolomite
- Z) graphite

ANSWER: Z) GRAPHITE

BONUS

10) CHEMISTRY *Short Answer* Give the symbol for the element that is derived from the Latin word Plumbum (pronounced: PLUM-bum):

ANSWER: Pb

TOSS-UP

11) PHYSICS *Short Answer* When a green colored object is illuminated by a green light it will appear as what color to the human eye?

ANSWER: GREEN

BONUS

11) PHYSICS *Short Answer* How many more times louder is 70 decibels than 10 decibels?

ANSWER: ONE MILLION

TOSS-UP

12) ASTRONOMY *Multiple Choice* According to Kepler's Third Law, plotting the squares of the periods of the planet against the cubes of the semi-major axes of their orbits will result in what sort of graph:

- W) a parabolic line
- X) a straight line
- Y) an irregular jagged line
- Z) a hyperbolic line

ANSWER: X) A STRAIGHT LINE

BONUS

12) ASTRONOMY *Short Answer* Who's book, titled "Concerning the Revolutions of Celestial Spheres", is considered to mark the birth of modern astronomy?

ANSWER: COPERNICUS

TOSS-UP

13) MATH *Multiple Choice* Which of the following mathematicians is responsible for the Cartesian plane that is also known as the rectangular coordinate system:

- W) Pythagoroas
- X) Rene Descartes
- Y) Kirk Godel
- Z) Fredric Gauss

ANSWER: X) RENE DESCARTES

BONUS

13) MATH *Short Answer* The imaginary unit “i” is numerically defined as what?

ANSWER: $\sqrt{-1}$ (ACCEPT: $i^2 = -1$)

TOSS-UP

14) EARTH SCIENCE *Multiple Choice* A glacier that has neither advanced nor retreated for many years deposits which of the following:

- W) terminal moraine
- X) end moraine
- Y) ground moraine
- Z) medial moraine

ANSWER: X) END MORaine

BONUS

14) EARTH SCIENCE *Short Answer* The name of this mineral is derived from the Latin word which means “to flow”. One of its major uses is as a flux to help melt iron ore. What is its name?

ANSWER: FLUORITE (ACCEPT: CALCIUM FLUORIDE OR CaF_2)

TOSS-UP

15) GENERAL SCIENCE *Multiple Choice* Photobiology is the branch of science which is basically concerned with:

- W) how organisms see
- X) how to record images of living systems with various optical instruments
- Y) the effects of visible and ultraviolet radiation on living systems
- Z) how living systems produce visible light

ANSWER: Y) THE EFFECTS OF VISIBLE AND ULTRAVIOLET RADIATION ON LIVING SYSTEMS

BONUS

15) GENERAL SCIENCE *Short Answer* At what temperature, rounded off to whole degrees Centigrade, does distilled water reach its maximum density at sea level?

ANSWER: 4 DEGREES

TOSS-UP

16) GENERAL SCIENCE *Multiple Choice* Which of the following would be a measurement of a computer screen's dot pitch:

- W) 0.25 millimeters
- X) 70 hertz
- Y) 1200 dpi
- Z) 650 megabytes

ANSWER: W) 0.25 MILLIMETERS

BONUS

16) GENERAL SCIENCE *Short Answer* What is a common type of video card that has an on-board processor that can substantially increase speed and boost graphical and video performance:

ANSWER: GRAPHICS ACCELERATOR CARD

TOSS-UP

17) BIOLOGY *Multiple Choice* Transfer RNA with an amino acid attached to it is called:

- W) a charged tRNA
- X) an amino acyl tRNA
- Y) a tRNA with an amino acid attached
- Z) t-primed RNA

ANSWER: X) AN AMINO ACYL tRNA

BONUS

17) BIOLOGY *Short Answer* This anatomical term means “nearer the midsagittal (pronounced: mid-SAJ-it-al) plane”:

ANSWER: MEDIAL

TOSS-UP

18) CHEMISTRY *Multiple Choice* Under which of the following conditions will iron rust:

- W) in water
- X) in water and oxygen
- Y) in oil
- Z) in oil and water

ANSWER: X) IN WATER AND OXYGEN

BONUS

18) CHEMISTRY *Short Answer* In order to compare two different gas samples, scientists use what is called the STP. What does STP stand for?

ANSWER: STANDARD TEMPERATURE AND PRESSURE (ACCEPT: 0°C OR 273 K AND 1 ATM OR 760 mm Hg)

TOSS-UP

19) PHYSICS *Multiple Choice* Cathode rays are actually:

- W) photons
- X) electrons
- Y) protons
- Z) positrons

ANSWER: X) ELECTRONS

BONUS

19) PHYSICS *Short Answer* In radio transmission, what does the acronym AM stand for?

ANSWER: AMPLITUDE MODULATION

TOSS-UP

20) ASTRONOMY *Multiple Choice* The time between two successive meridian transits of the Sun as observed from a stationary spot on the Earth's surface is called:

- W) the stellar day
- X) an apparent solar day
- Y) lunar day
- Z) an apparent solar month

ANSWER: X) AN APPARENT SOLAR DAY

BONUS

20) ASTRONOMY *Short Answer* The celestial coordinate analogous to latitude is called:

ANSWER: DECLINATION

TOSS-UP

21) MATH *Short Answer* Where is the y intercept for $y = \sin x$?

ANSWER: ZERO

BONUS

21) MATH *Short Answer* The product of 6 factorial is how many times larger than the product of 5 factorial?

ANSWER: 6

(Solution: $6! = 720$, $5! = 120$ and $720 \div 120 = 6$)

TOSS-UP

22) EARTH SCIENCE *Multiple Choice* A high pressure center is associated with what kind of weather:

- W) warm and dry
- X) warm and wet
- Y) cool and dry
- Z) cool and wet

ANSWER: Y) COOL AND DRY

BONUS

22) EARTH SCIENCE *Short Answer* What is the name given to the region of the Earth's mantle located from about 75 to 300 kilometers below the surface, where rocks have little strength?

ANSWER: ASTHENOSPHERE

TOSS-UP

23) BIOLOGY *Multiple Choice* Which of the following is true about a brain cell from a 'normal' individual human:

- W) some DNA sequences are present in multiple copies
- X) most of the DNA codes for protein
- Y) most genes are transcribed
- Z) most genes are arranged in operon-like (pronounced: OPP-err-on) clusters

ANSWER: W) SOME DNA SEQUENCES ARE PRESENT IN MULTIPLE COPIES

BONUS

23) BIOLOGY *Short Answer* The gustatory (pronounced: GUS-tah-tory) system has to do mostly with what human sense?

ANSWER: TASTE

TOSS-UP

24) CHEMISTRY *Multiple Choice* Which of the following is NOT true about the Periodic Table:

- W) metals tend to gain electrons while nonmetals tend to lose electrons
- X) metals tend to lose electrons while nonmetals tend to gain electrons
- Y) elements with metallic properties are found on the left side of the table
- Z) alkali metals are found in the vertical column that contains lithium

ANSWER: W) METALS TEND TO GAIN ELECTRONS WHILE NONMETALS TEND TO LOSE ELECTRONS

BONUS

24) CHEMISTRY *Short Answer* Until the early 1960's, what group of elements were called the inert gases:

ANSWER: NOBLE GASES

TOSS-UP

25) PHYSICS *Multiple Choice* A crane lifts a 4,000 ton concrete slab 10 feet above the ground in 5 seconds. If it does the same task in 10 seconds, this involves a different amount of what:

- W) energy
- X) work
- Y) power
- Z) potential energy

ANSWER: Y) POWER

(Solution: Power is a rate of doing work; W, X and Z remain constant under these circumstances)

BONUS

25) PHYSICS *Short Answer* A coil of wire that produces a magnetic field is typically called a:

ANSWER: SOLENOID